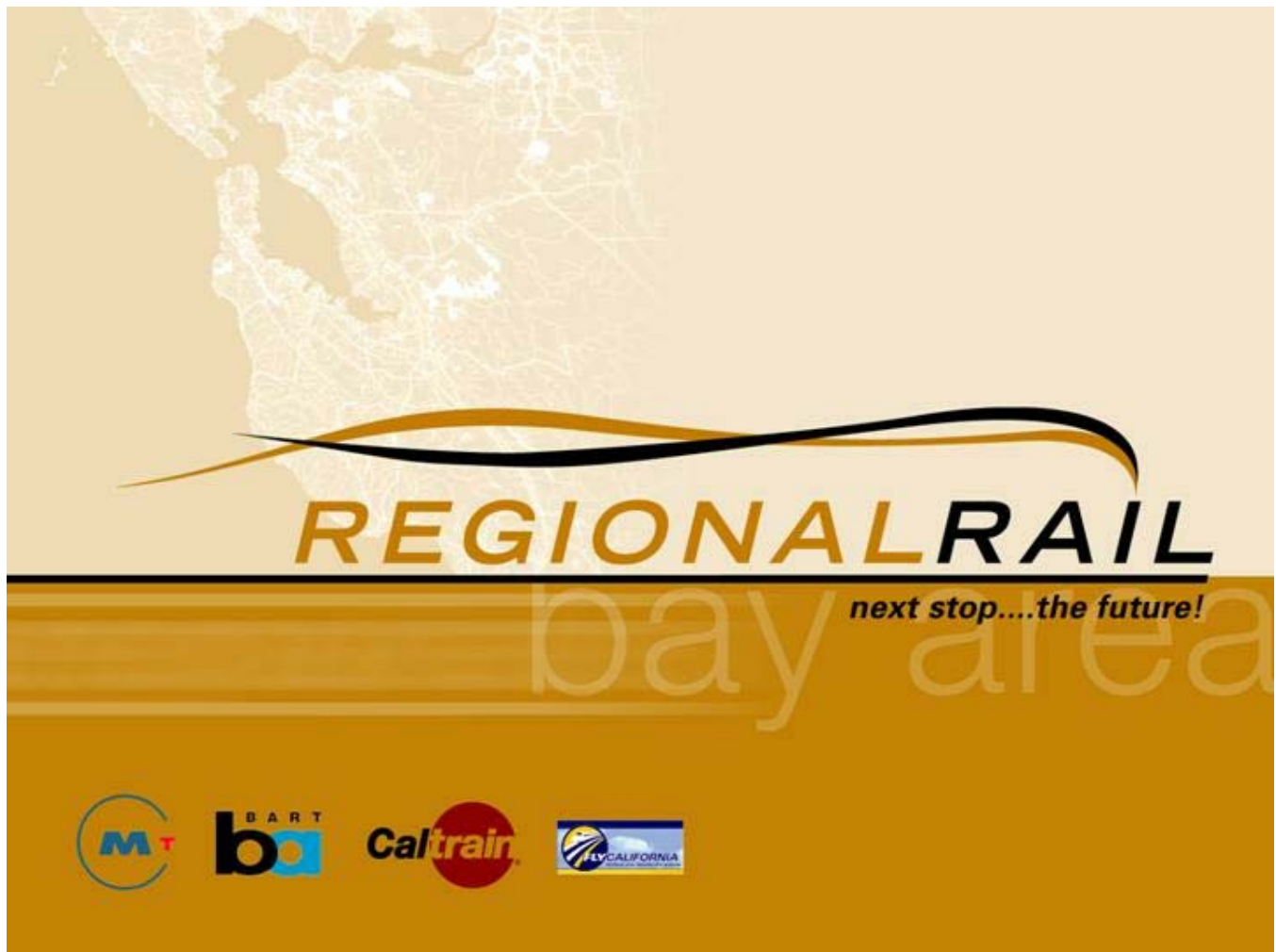


BAY AREA REGIONAL RAIL PLAN

TECHNICAL ANALYSIS OF STUDY ALTERNATIVES

DRAFT Technical Memorandum for Task 4h
**Innovative Approaches to Freight Handling on Regional
Railroad Lines**



May 9, 2007

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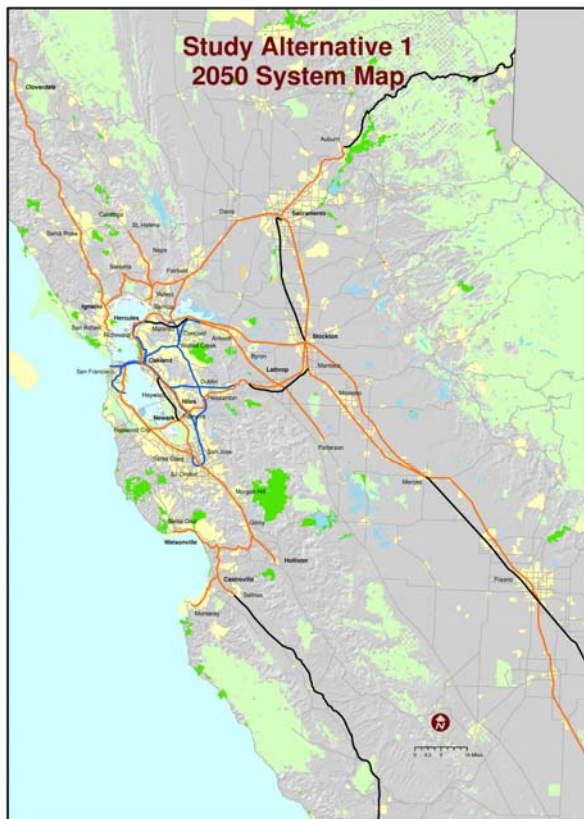
Appendix A California Inter-Regional Intermodal System (CIRIS) Final Report, June 2006	
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1.0 Introduction

This Technical Memorandum focuses on Task 4h of the work scope for the Bay Area Regional Rail Plan. Specifically, the purpose of Task 4h is to develop innovative approaches to freight handling on regional railroad lines in the Bay Area. This analysis uses the California Inter-Regional Intermodal System (CIRIS) studies from October 2003 and June 2006 as a basis for possible freight handling concepts, including potential short haul freight traffic, routes, and infrastructure requirements. It describes the impacts and benefits, as well as economic issues associated with development of short haul freight. The main goal is to identify a strategy for short haul freight that balances the capacity needs for long haul freight and passenger rail services in the overall regional network. In doing so, short haul freight services could reduce the amount of trucks on highways, thereby alleviating congestion and improving air quality.

In addition to the CIRIS studies, the Study Alternatives 1 and 2 developed under Technical Memorandum 3b were considered in this freight analysis (see Figure 1-1 and Figure 1-2). Furthermore, the capacity issues outlined in Technical Memorandum 4g are also incorporated, identifying the issues and constraints associated with the regional rail network. This information provides a solid foundation for the innovative approaches to freight rail handling in the San Francisco Bay Area.

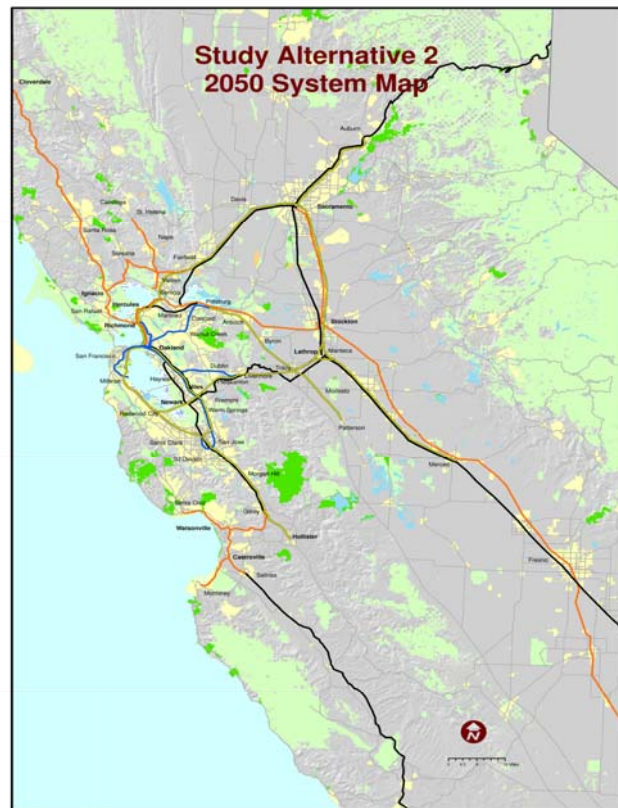
Figure 1-1: Study Alternative 1



Legend

- HSR only, light weight equipment, double track, fully grade separated
- Regional Passenger Rail, light weight, fully grade separated
- HSR with Regional Passenger Rail
- Freight/Regional Rail
- Predominantly freight, standard equipment
- BAIT
- Federal Lands
- Park Areas
- Conservation Areas

Figure 1-2: Study Alternative 2



Legend

- HSR only, light weight equipment, double track, fully grade separated
- Regional Passenger Rail, light weight, fully grade separated
- HSR with Regional Passenger Rail
- Freight/Regional Rail
- Predominantly freight, standard equipment
- BAIT
- Federal Lands
- Park Areas
- Conservation Areas

2.0 Background

Foreign trade is a cornerstone of California's prosperity, with significant imports and exports in the San Francisco Bay Area and Central Valley. Transportation of international containers between the Central Valley and the Port of Oakland is Northern California's lifeline to foreign markets, but that lifeline is threatened. If exporters must rely on increasingly congested freeways to move their goods, both their ability to compete and the region's ability to grow will be jeopardized. If importers must rely on those same freeways, they will locate elsewhere.

Furthermore, regional planners, congestion management agencies, and regional air quality management districts are all interested in reducing highway congestion and improving air quality by shifting freight presently moving by highway to the regional rail network. At the same time, there is a major emphasis on reducing auto traffic by increasing use of the regional rail network to move significantly more rail passengers, particularly during peak commute hours.

As a result, there is a potential conflict between increased use of the freight rail network for passenger rail initiatives and increased use of the regional rail system to divert highway truck traffic. The question to be answered is: how can short-haul freight be incorporated into a regional railway system where long haul freight is growing significantly and where there is also a desire and need for use of the same network to expand regional passenger service at the same time? Stated differently, how can short haul freight be incorporated into the regional rail system in the most innovative and least costly manner? This technical memorandum serves to answer those questions.

3.0 The CIRIS Concept

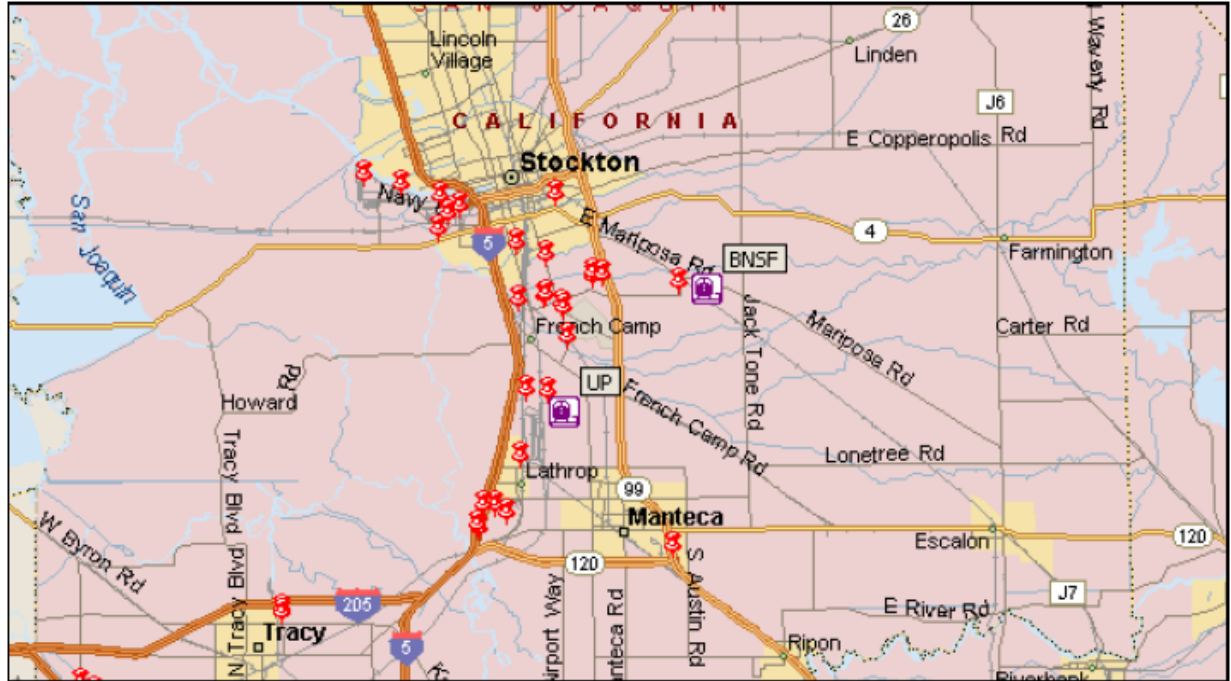
The California Inter-Regional Intermodal System (CIRIS) study from June 2006 (Appendix A) is envisioned as an umbrella concept for rail intermodal service between the Port of Oakland and its Northern California hinterland handling only international commerce. Inland intermodal facilities served by rail shuttle operations offer potential solutions to Northern California's looming need for better trade lifelines to San Francisco Bay Area ports. At present there are significant movements of international containers between the Port of Oakland and numerous points in the Central Valley. Additionally, traffic is drayed over the highway network, increasing both highway congestion and emissions of air pollutants, including green house gasses. If an efficient and economical way could be found to shift this container traffic to the rail network, there could be significant air quality and traffic benefits for the entire region.

3.1 *CIRIS Market*

Previous feasibility studies have established the potential markets, viability and value of the CIRIS concept and concluded that it is worth pursuing from multiple perspectives. The types of freight movements that could be accommodated via CIRIS include:

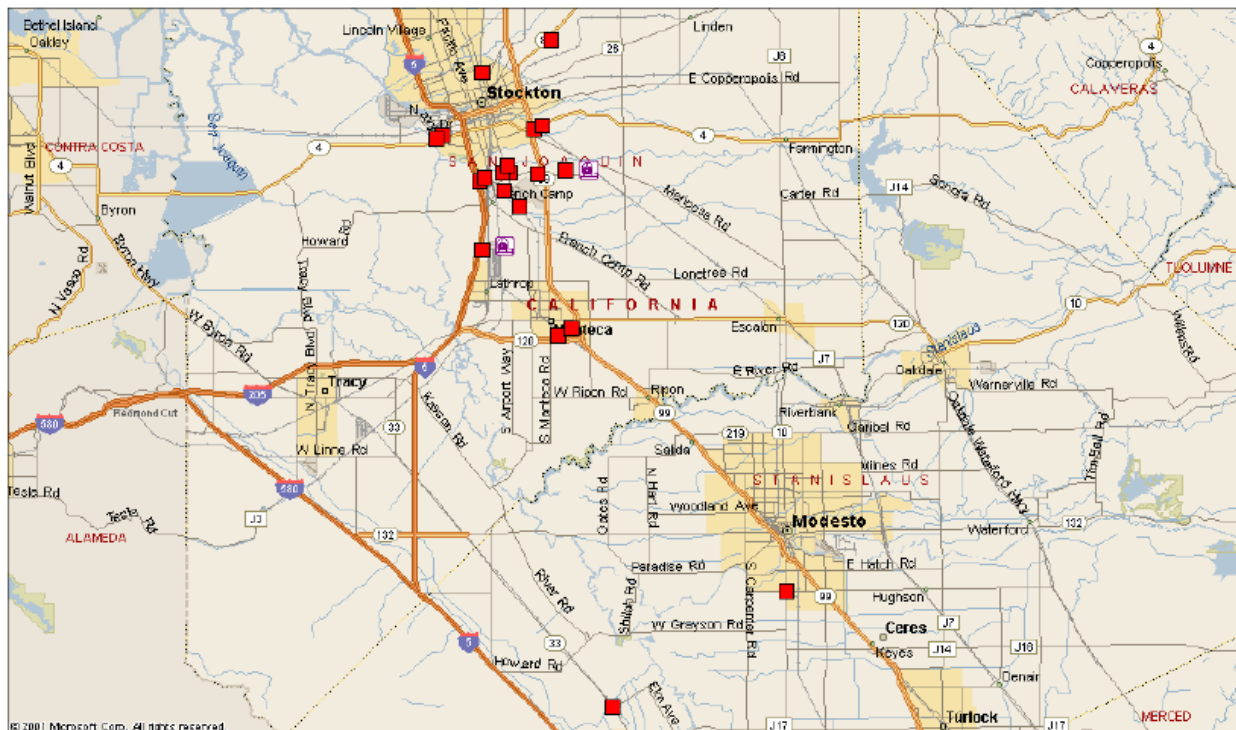
- **Imports and Exports** – Major importer and exporter locations within San Joaquin County for the CIRIS concept are shown in Figure 3-1. The major clusters are in west Stockton around Charter Way and Rough and Ready Island; south of Stockton around Stockton Metropolitan Airport; west of Manteca near the I-5/SR120 interchange; in and around Lodi; and in the Tracy I-205/I-5/I-580 "triangle." The Lodi sites may be difficult to reach economically unless Sacramento service is begun, and the Tracy "triangle" is probably too close to Oakland for truckers to backtrack to Lathrop or Stockton. However, the majority of the Stockton-area sites are with a 30-minute driving radius of BNSF and UP terminals.

Figure 3-1: San Joaquin County Importer and Exporter Locations



New potential CIRIS customers are likely to be large distribution or manufacturing facilities located in major industrial parks. Figure 3-2 shows the locations of major Stockton-Lathrop area industrial parks under current development.

Figure 3-2: Regional Industrial Parks under Development



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- **Transloads** – “Transloading” involves transferring import or export loads between highway trailers, which are constrained by highway weight limits, and marine containers that can hold more weight on a rail or ocean trip. Transloaded exports and imports move between Central Valley markets and the Port of Oakland are in conventional trucks and are therefore not recognized as port traffic. The goods are typically containerized at facilities near the Port.
- **Dedicated Intra-Regional Trains** – Dedicated trains could possibly connect facilities such as the NUMMI Fremont and Central Valley fabrication plants.

The first phase of CIRIS service is targeted at the Stockton-Modesto and Fresno markets, which are served by active intermodal terminals. Serving only the Stockton-Modesto market at start-up, CIRIS would be expected to handle about 28 container trips each way. At maximum build-out, CIRIS trains could replace as many as 776 daily truck trips at 2003 volumes. Containers would be mostly loaded in the westbound export direction and mostly empty in the eastbound import direction. However, with import traffic there would still be movement of empties both ways on rail just as there is with trucks because of the ownership of containers. The benefits of import traffic would therefore include: higher utilization of intermodal ramp facilities and spreading capital costs including rail infrastructure over more traffic.

The Central and Southern San Joaquin Valley markets for containerized cargo moving through the Port of Oakland are grouped around the major population centers. Although most of the exports are derived from agriculture, the shipping points are in the cities.

As Figure 3-3 suggests, San Joaquin and Stanislaus counties together form a distinct market, which is referred to as “Stockton/Modesto.” There is reportedly very little cargo from Merced County, despite the existence of some underlying production there, leaving a gap between the two larger markets. Likewise, there is a second market cluster around Fresno, including much of Madera and Tulare counties. A third, smaller cluster is centered in Bakersfield.

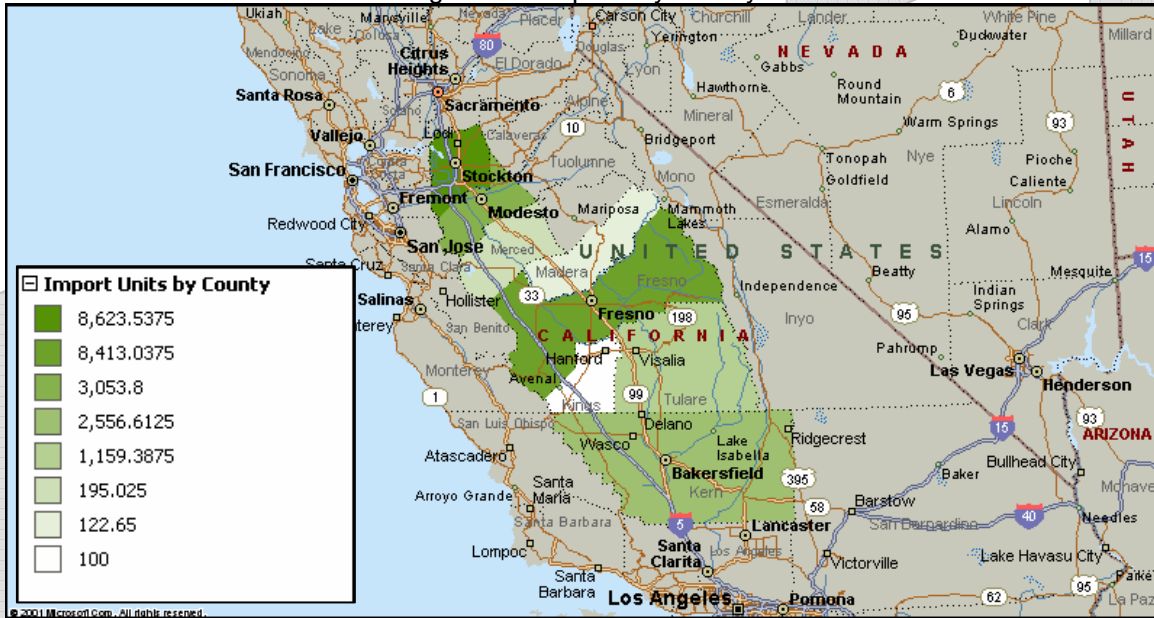
Figure 3-3: Exports by County



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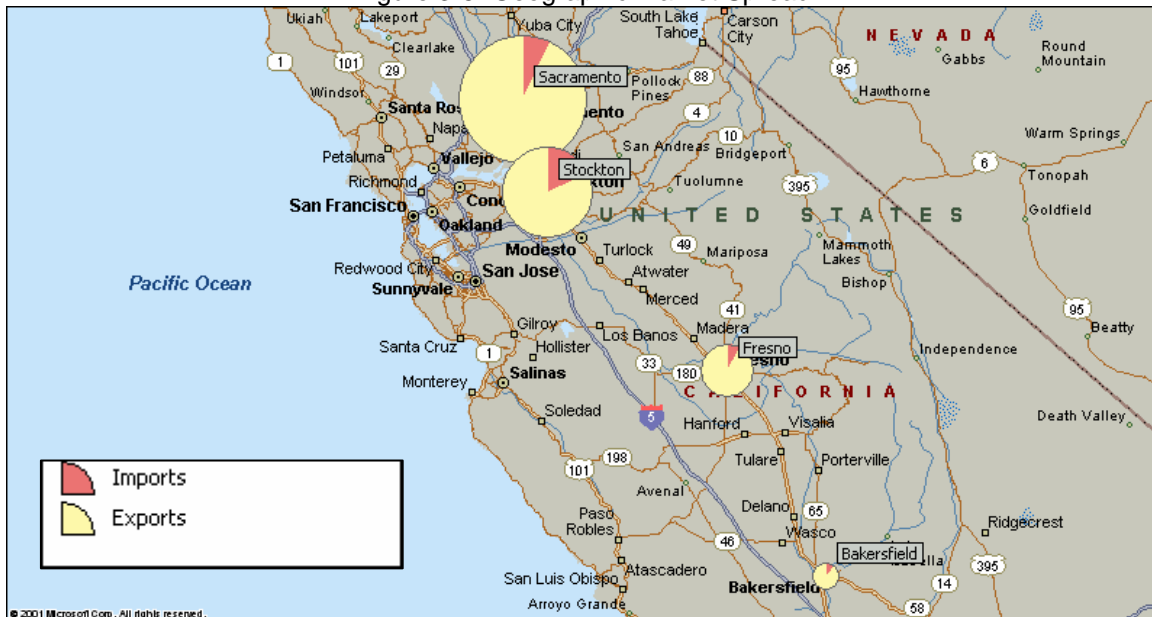
The import pattern is basically the same, although the volumes are much smaller (Figure 3-4). There is a cluster of warehousing and distribution activity in the Stockton/Lathrop areas of San Joaquin County and a second in the Beard Industrial Tract in Stanislaus County. These facilities serve not only Valley customers, but regional and national customers as well. The next cluster is in Fresno County, serving the San Joaquin Valley itself, with relatively little import activity in Merced, Madera, King, or Tulare. Finally, the southernmost cluster is in Kern County.

Figure 3-4: Imports by County



The geographic distribution of the market is shown in Figure 3-5. The Sacramento market has the largest total, but is not practically accessible. The Bakersfield market, as indicated, is relatively small and distant.

Figure 3-5: Geographic Market Spread



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The marked import/export imbalance is also apparent in the previous Figure 3-5. The vast bulk of Northern California imports are destined for the San Francisco Peninsula or the East Bay, either for local consumption or forward distribution to other markets. Stockton/Modesto exports outnumber imports by over 4 to 1. In the Fresno market, the ratio is over 10 to 1.

Containerized cargo is commonly measured in Twenty-Foot Equivalent Units (TEU – the equivalent cargo capacity of a 20 foot container). The available data (Port Import Export Reporting Service – PIERs) has been adjusted to more accurately reflect the Central Valley cargo, as shown in Table 3-1.

Table 3-1: Estimated Market Volumes, Annual Containers (at 1.6 TEU/Container)

Market	Exports		Imports		Total	
	PIERS	Adjusted	PIERS	Adjusted	PIERS	Adjusted
Stockton-Modesto						
Perishable Food/Farm	9,289	16,895	369	369	9,658	17,264
Non-Perishable Food/Farm	16,655	33,852	1,369	1,369	18,024	35,221
Other	5,059	6,043	11,055	11,055	16,113	17,098
Subtotal	31,003	56,790	12,793	12,793	43,796	69,582
Fresno						
Perishable Food/Farm	12,289	22,352	72	72	12,361	22,424
Non-Perishable Food/Farm	9,621	19,554	756	756	10,377	20,310
Other	12,816	15,311	4,381	4,381	17,197	19,692
Subtotal	34,726	57,216	5,210	5,210	39,936	62,426
Accessible Rail Shuttle Market	65,729	114,006	18,002	18,002	83,731	132,008
Bakersfield						
Perishable Food/Farm	11,597	21,093	475	475	12,073	21,568
Non-Perishable Food/Farm	120	243	424	424	544	667
Other	4,786	5,718	2,682	2,682	7,468	8,400
Subtotal	16,503	27,054	3,582	3,582	20,085	30,636
Sacramento						
Perishable Food/Farm	9,534	17,341	277	277	9,812	17,618
Non-Perishable Food/Farm	22,287	45,299	905	905	23,192	46,204
Other	4,420	5,280	3,990	3,990	8,410	9,271
Subtotal	36,242	67,920	5,172	5,172	41,414	73,092
Other Central Valley Markets	52,745	94,974	8,754	8,754	61,498	103,728

The volumes for the Stockton-Modesto and Fresno markets were forecasted to the year 2020, as shown in Table 3-2.

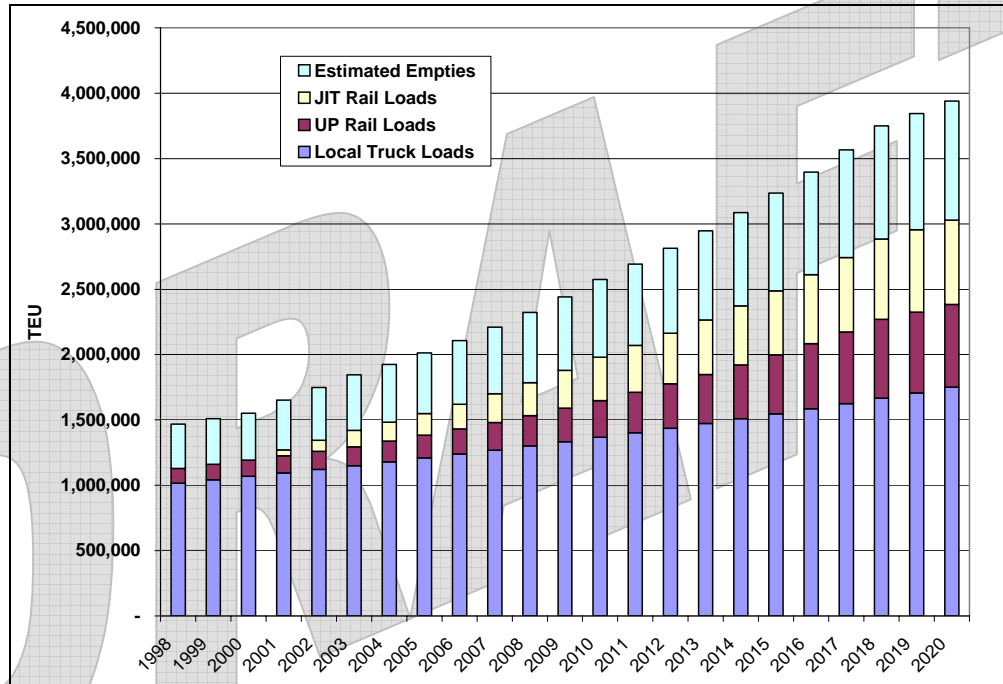
Table 3-2: Stockton-Modesto and Fresno Markets in Year 2020

Market	Exports	Imports	Total
Stockton-Modesto:			
Perishable	38,723	846	39,569
Non-perishable	77,589	3,37	80,726
Other	13,852	25,337	39,189
Subtotal	130,163	29,321	159,484
Fresno:			
Perishable	51,230	165	51,395
Non-perishable	44,818	1,734	46,552
Other	35,092	10,042	45,134
Subtotal	131,140	11,941	143,061
Accessible Rail Market	261,304	41,262	302,565

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Figure 3-6 gives a recent Port of Oakland forecast for containerized cargo growth to the year 2020, averaging about 5 percent annually for the near future. The flow is a complex mixture of import and export loads and empty containers moving by rail and truck.

Figure 3-6: Port of Oakland Containerized Cargo Growth Forecast



Very importantly, neither the 2020 forecast of imports/exports nor the Port of Oakland projections include any one-time effect of a major importer opening a major, large Northern California distribution center in the Central Valley. However, one of the objectives of the CIRIS concept, the Port of Oakland, and the various developers in the Central Valley is to attract several such businesses to the area.

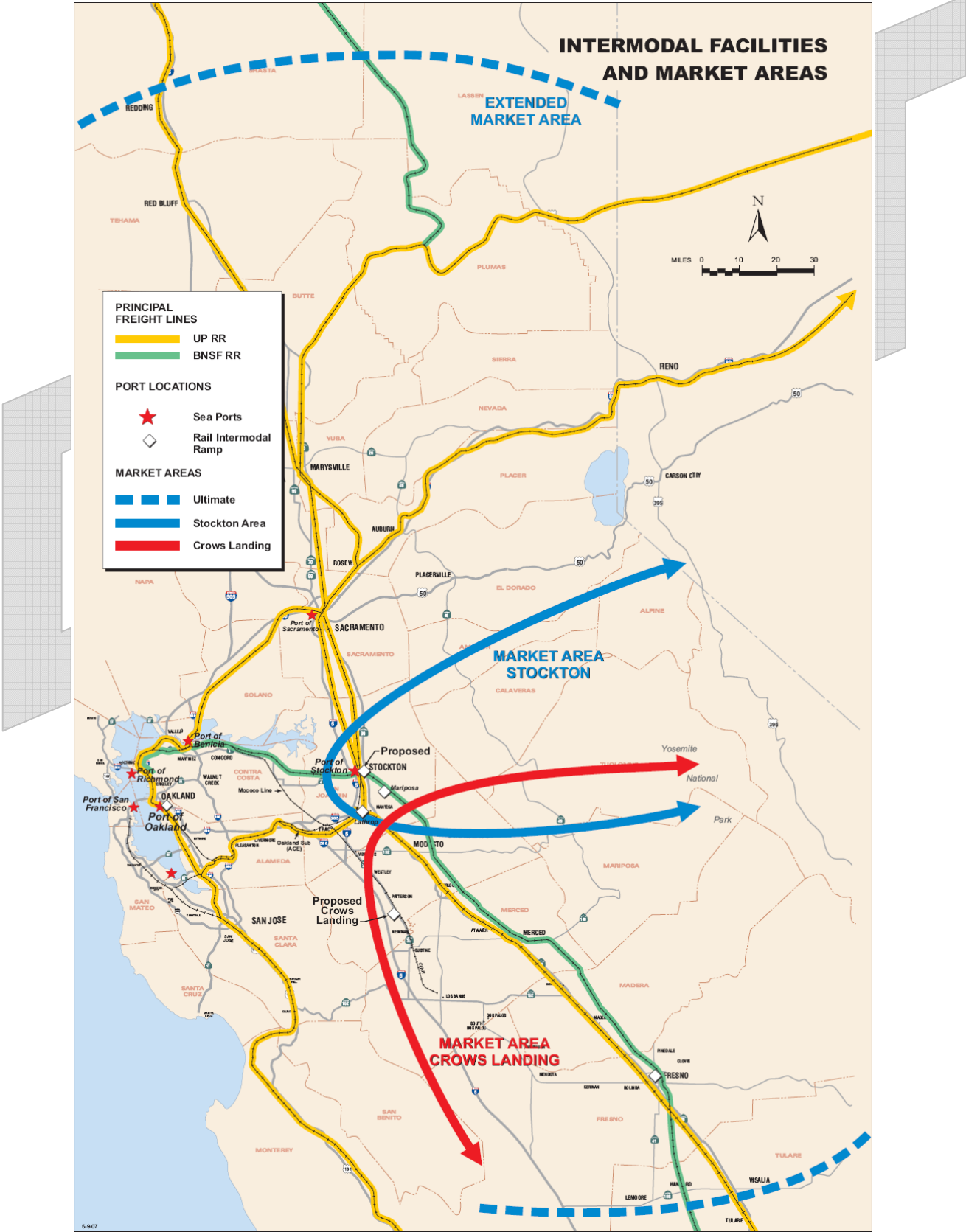
3.2 Intermodal Terminal Facilities

The study area includes multiple existing intermodal rail facilities for both BNSF and UP, with each having a "natural catch basin" for the geographical market that it would logically serve (Figure 3-7). This includes the Oakland Intermodal Gateway at the Port of Oakland, Mariposa at Stockton and Fresno on the BNSF rail lines. The BNSF's intermodal terminal in Richmond is being closed. The UP has the Port of Oakland and Lathrop facilities. UP's "ramp" at Fresno is a "paper ramp," a location from which intermodal trailers and containers are drayed to and from the actual ramp at Lathrop. No intermodal facilities exist for the various shortline, regional and switching railroads in the study area.

Potential sites for new intermodal terminals include Crows Landing on the California Northern (CFNR) rail line and Port of Stockton. Other locations that are possible but unlikely in the near term are the Sharpe Army Depot, sidings in Fresno, Roseville/McCellan, Suisan, Woodland, Davis, Tehama, and Napa.

The Central Valley locations are prime candidates for transloading facilities relocating from Oakland due to urban development pressure and the Port's need for using the land for marine terminals. Rough and Ready Island at the Port of Stockton offers an ideal site, and transloading has been identified as an early CIRIS implementation objective.

Figure 3-7: Intermodal Facilities and Market Areas



4.0 Capacity Issues

4.1 *Port of Oakland*

The main driving force behind the CIRIS concept is the continuing growth at the Port of Oakland, coupled with poor accessibility. As such, the Port of Oakland is rarely the Port of First Call on eastbound sailings at present time due to poor access to the nation, as well as smaller import markets into Northern California versus Southern California and other competing West Coast ports.

Based on the Port of Oakland's recently completed 20-year growth plan, the increase in the proportion of containers arriving or leaving the Port by rail could grow by close to 300 percent. The greatest bulk of the Port related rail traffic would be to inland locations located at least 1,000 miles to the east. What establishes a strong symbiotic relationship between the Port of Oakland and San Joaquin County is that the Port is the gateway for containerized export of agricultural and other commodities from Central Valley producers and for a growing flow of imports to Central Valley distribution centers. Both flows are a mainstay of the Port's business.

Over the last decade the containerized cargo flow between the Port of Oakland and the Central Valley has grown steadily to the benefit of the region as a whole. Cargo growth has paralleled population growth. The local portion of the cargo that is handled by truck is expected to grow and remain the largest segment, with a large portion of this traffic being trucked over Altamont Pass into and from San Joaquin County and the upper San Joaquin Valley. Caltrans estimates that 5-axle trucks now account for 10 percent of all vehicles on the increasingly congested Interstate 205. As the highways connecting the Port of Oakland and the Central Valley approach capacity there has been increasing interest in alternative modes, particularly rail.

Accordingly, the Port of Oakland is interested in developing the short haul freight initiative known as CIRIS. The Port proposes to shift freight moving into the Central Valley from highway to rail over Altamont Pass to either the Stockton/Lodi area or to Patterson. Because there are two class one rail carriers – Union Pacific and BNSF – serving the Port of Oakland and each carrier has several routing choices that serve multiple destinations and inland interchange locations, it is difficult to allocate the growth between carriers and routes. However, traffic leaving the Port of Oakland initially must either travel over the Martinez or the Niles and Coast Subdivisions of the UP, both of which have existing freight and passenger services.

In addition to increasing rail capacity (including tunnel clearances over Donner), potential dredging would allow bigger ships to access the Port of Oakland, thereby attracting International "bridge traffic" to the Midwest and beyond. Further, with the advent of one or more major importers choosing to locate a major distribution center in Northern California (and being served by an Inland Port served via short haul freight rather than just trucking in from Oakland), a synergy is created that would benefit the Port of Oakland, Bay Area economy and overall economic vitality of Northern California "super-region."

4.2 Rail Lines

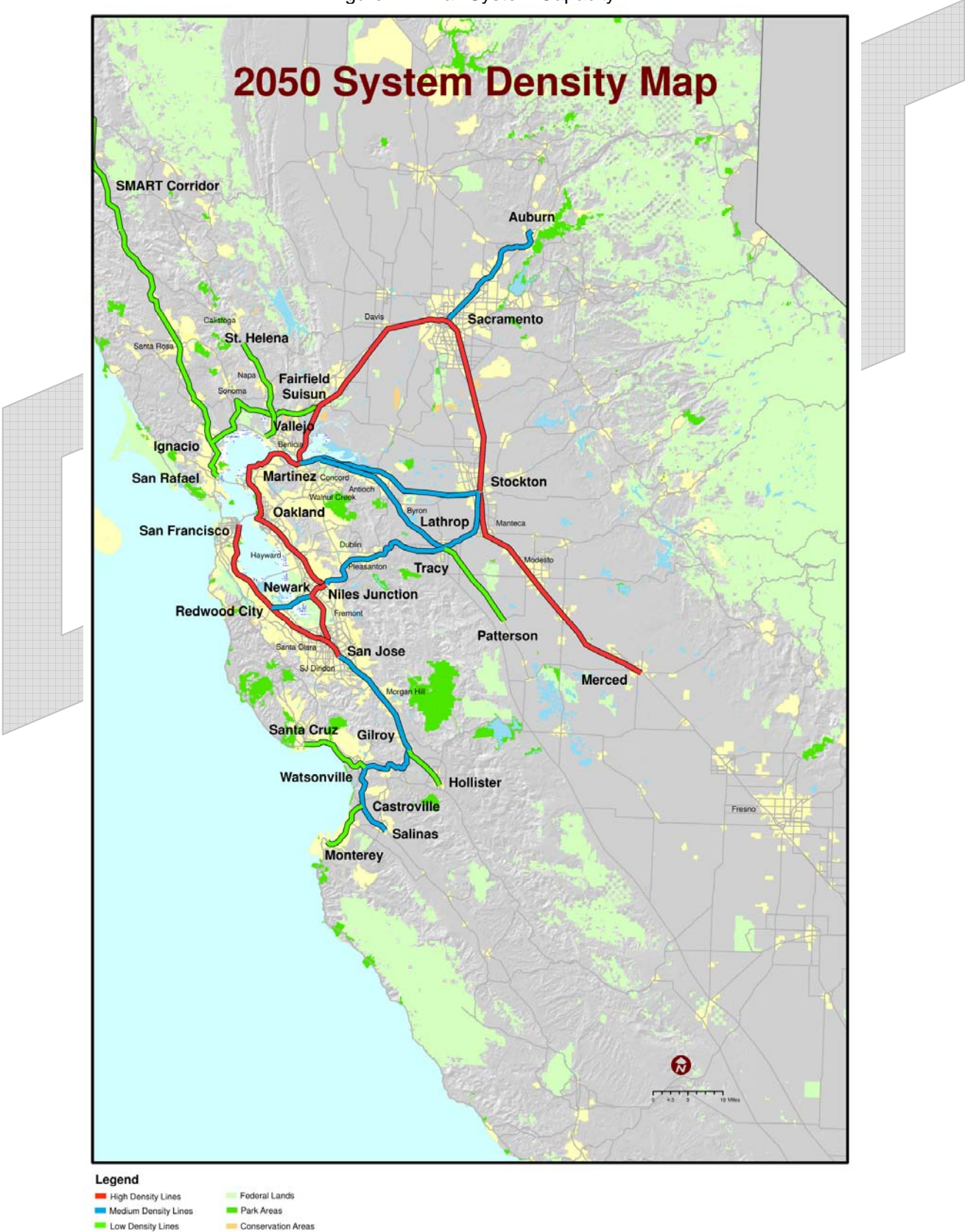
Implementing regional rail short hauls such as CIRIS at the same time regional passenger services are expanded to help relieve highway congestion would place significant demands for additional capacity on the existing regional rail network. All of this comes at a time when long haul rail freight traffic has expanded to the point where rail line capacity has become relatively scarce, particularly on corridors that would be logical routes, both for CIRIS and for expanded rail passenger services.

Technical Memorandum 4g provides an overview of current railroad capacity issues. Many of the more important rail corridors for both CIRIS and expanded passenger use are at or near capacity today. These capacity constrained corridors include the UP's Martinez, Niles Coast and Fresno Subdivisions, as well as the BNSF's Stockton and Bakersfield Subdivisions. As a result, there is a desire for innovative freight handling techniques that would alleviate some of these capacity issues. Yet increased use of rail corridors for both passenger and short haul freight operations can and mostly likely would introduce additional capacity issues unless ways can be found to significantly increase capacity for the regional rail network.

Rail line capacity is a function of a number of factors, driven first and foremost by freight railroad needs and passenger rail access to freight railroad trackage. Technical Memorandum 4g included a discussion of the major factors affecting regional rail line capacity now and into the future, delineating the long term capacity of the regional rail system in the year 2050. Figure 4-1 shows the rail lines categorized into three corridors – high density, medium density, and low density – providing a general overview of the capacity constraints and opportunities for each corridor.

- **High density** corridors are those proposed for major growth either in freight traffic and/or passenger traffic, possible electrification, use of electrified and possibly non Federal Railroad Administration (FRA) compliant passenger equipment. These are potential four track corridors, with freight and passenger trains operating on separate exclusive use tracks. Corridors that either fit in this category today or are forecast to reach this status in the future include: **Sacramento to Oakland, Oakland to San Jose, Sacramento to Merced, and San Francisco to San Jose.**
- **Medium density** corridors are those with mixed freight and regional commuter operations, which use compliant equipment and are not expected to be electrified. Corridors in this category include: **Auburn to Sacramento, Stockton to Martinez, Lathrup to Martinez, Niles Junction to Stockton, Redwood Junction to Newark, San Jose to Salinas.** The future route of High Speed Rail could shift either the Niles Junction to Stockton or the San Jose to Salinas corridors from medium to high density depending on the route alternative chosen.
- **Low density** corridors are those with either minimal freight or low passenger use, usually offering only peak hour service, possibly only one direction in the morning and the other direction in the evening. This type of corridor will have freight with non-electrified regional commuter operations. These corridors include: **The Smart Corridor, Ignacio to Fairfield/Suisun, St. Helena to Vallejo, Tracy to Los Banos, Santa Cruz to Watsonville Junction, Castroville to Monterey, and Carnadero to Hollister.**

Figure 4-1: Rail System Capacity



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- **The UP Martinez Subdivision – Capitol Corridor.** The UP Martinez Subdivision is an example of a High Density Corridor at the present time. The Martinez Subdivision has a weekday average of 44 regular passenger trains, approximately 32 to 40 UP local and through freight movements and 6 to 8 BNSF trackage rights freight movements. This Subdivision is operating at or above practical capacity at the present time. Any maintenance work will result in significant delays. Line interruptions caused by bridge openings at the Benicia crossing of the strait and the I Street Bridge in Sacramento, mechanical breakdowns or grade crossing accidents cause a ripple effect of cascading delays. Capitol Corridor trains have sometimes been delayed in excess of two hours enroute between Sacramento and Oakland. This leads to a fairly high degree of unreliability for rail passengers.

To build robustness into the system and increase on time performance, there are a number of initiatives under discussion. For several years, the UP and the Capitol Corridor Joint Powers Authority (CCJPA) have been performing simulations to identify capacity related issues and potential solutions short of adding an additional main track all the way from Sacramento to Oakland. There are many mitigating measures that have been identified. Under current operations and laws, these initiatives will not be realized without the consent of the UP, and they would possibly only agree if additional capacity can be built into the Martinez Subdivision or if routed differently.

- **UP Oakland Subdivision.** The UP Oakland Subdivision is an example of a Medium Density corridor. This corridor is presently operating well below “Practical Capacity.” The Oakland Subdivision connects with the two main tracks of the Niles Subdivision at Melrose, milepost (mp) 10.56. It is basically a single track mainline with passing sidings controlled by a Centralized Traffic Control (CTC) system. It parallels the Niles Subdivision from Melrose to Niles Junction where there is a second connection to the Niles Subdivision at mp 30.36. At the present time, this northern portion is used only for local movements, and there is no through-train operation.

The portion of the Oakland Subdivision from Niles Jct. at mp 30.36 to Lathrop at mp 84.45 is used by both UP freight trains and Altamont Commuter Express (ACE) commuter passenger trains. At Lathrop, the Oakland Subdivision, which continues north to Stockton at mp 92.92, also connects with the two main tracks of the UP’s Fresno Subdivision. The Fresno Subdivision parallels the Oakland Subdivision from Lathrop to Stockton.

The Oakland Subdivision was handling 16 to 18 UP freight trains and in addition, 2 to 4 Southern Pacific (SP) trackage rights trains at the time ACE commuter service began with 6 trains per day, Monday through Friday. ACE trains leave the Oakland Subdivision at Niles Junction, operating on the Niles Subdivision to Newark and then south to San Jose on the Coast Subdivision. Since the UP acquisition of the SP, ACE trains frequently operate via the Fresno Subdivision rather than the Oakland Subdivision to Lathrop and Stockton. The Stockton passenger station used by ACE is actually located on the Fresno Subdivision, and by using the Fresno Subdivision, the ACE trains avoid the congestion around the UP’s Lathrop Intermodal Facility and the UP’s Stockton Yard.

Traffic levels have actually decreased significantly on the Oakland Subdivision since the UP acquired the SP in 1996. Much of the traffic that used to traverse the Oakland Subdivision between Sacramento, Stockton and Oakland, San Jose and Milpitas now takes the more direct, shorter route to Sacramento by utilizing the UP Martinez Subdivision. ACE service is now four pair of (8) trains each weekday. However, UP freight operations are now at 8 to 10 train movements per day.

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ACE had reached a tentative agreement with the UP to run up to 6 pair of (12) trains per day between Stockton and San Jose. ACE agreed to upgrade the connection between the Oakland Subdivision and the Fresno Subdivision at Lathrop, and to either lengthen or build new sidings between Lathrop and Niles Junction.

The real capacity challenges are on the West End and are the result of capacity issues on the Niles and Coast Subdivisions. Even if the Oakland Subdivision between Niles Junction and Melrose were placed back into service, the congestion on the Niles Subdivision between Melrose and Oakland, through Jack London Square, is still the principal constraint to increasing traffic on the Oakland Subdivision. Currently discussions are under way to make three mainlines through Jack London.

- **UP Mococo/Fresno Line.** The entire UP Mococo/Fresno Line is owned by the Union Pacific. The 337-mile route originates at the Port of Oakland then arches north to Richmond and Martinez on the UP Martinez Subdivision discussed earlier and then moves south to Bakersfield. The rail line between the Port of Oakland and North Richmond is heavily traveled by both UP, BNSF and Amtrak trains. While the UP owns this portion of the track, the BNSF and Amtrak have trackage rights to operate on the line.

The line between Port Chicago and Pittsburg is currently out of service, but the track is still in place. Southern Pacific Railroad stopped using and maintaining the line in the late 1980s and early 1990s apparently due to the company's financial trouble. The speeds at the time prior to abandonment were between 30 and 50 miles per hour (mph). At the present time, the UP is storing cars on the line. The speed on this line, once the stored cars are removed, would probably be no more than 10 mph.

On average, the speeds on the portions of the UP Mococo/Fresno Lines that are actually operating range from 40 to 60 mph. The UP has an intermodal terminal located at Lathrop and a paper ramp at Fresno. The portion of the UP route between Oakland and Port Chicago is shared with Amtrak and BNSF through trackage rights. Amtrak routes the Capitols, the San Joaquins, the Coast Starlight, and the California Zephyr over this route. BNSF uses this route to reach the Oakland International Gateway (OIG), carload interchange customers in the Oakland area, and the NUMMI plant at Warm Springs.

This intensive use results in congested conditions even though the route is double track CTC. In previous studies, the 38-mile segment from Oakland to Port Chicago was labeled the "East Bay Bottleneck." Capitols, Coast Starlights, and California Zephyrs leave the route at Martinez to head toward Sacramento. San Joaquins leave the UP line at Port Chicago and use the BNSF route through the Delta.

The total train capacity on the route is dependent upon the number of tracks and the type of signaling. In the heavier capacity routes between Port of Oakland and the Martinez line is CTC controlled and double tracked. The southern portion of the track between Stockton and Bakersfield is CTC controlled and single track. Based on these factors, it is estimated that the northern portion of this route is operating up to 80 percent capacity, with a significant portion of the capacity taken up with the Amtrak trains. The southern portion of the line ranges from approximately 30 to 60 percent. No Amtrak trains operate on the southern portion of the UP Mococo/Fresno route.

The capacity on the operating portions of the route appears to have room for expansion. However, all of the routes through the Central Valley pass through towns and cities with many road crossings. So while the speed limit is posted at 60 to 70 mph, in reality the trains must slow to deal with the road crossings, train meets, and slow orders on the routes.

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Increasing the number of trains on this route should not strain the network if the new service is scheduled for off peak hours. Since the Mococo Line is not currently serviceable, this route is not a candidate for CIRIS start-up or demonstration service. The availability of this route for long-term CIRIS operation is complex and unlikely to be resolved in the near future.

Moreover, BART is interested in acquiring or using the Mococo Line to extend eBART service into Eastern Contra Costa County and eventually towards San Joaquin County. The eBART project team is a partnership among BART, the Contra Costa Transportation Authority (CCTA) and the communities in East Contra Costa County. BART and the Federal Transit Administration (FTA) are co-lead agencies in the environmental review process for the eBART project. In a 2002 feasibility study, BART and CCTA recommended diesel multiple unit (DMU) trains that would operate in the median of State Route 4 and then travel southeast to Byron. The current project schedule envisions construction starting after 2007 and operations beginning in 2010, although the feasibility study indicates a minimum of seven years for service out to Byron.

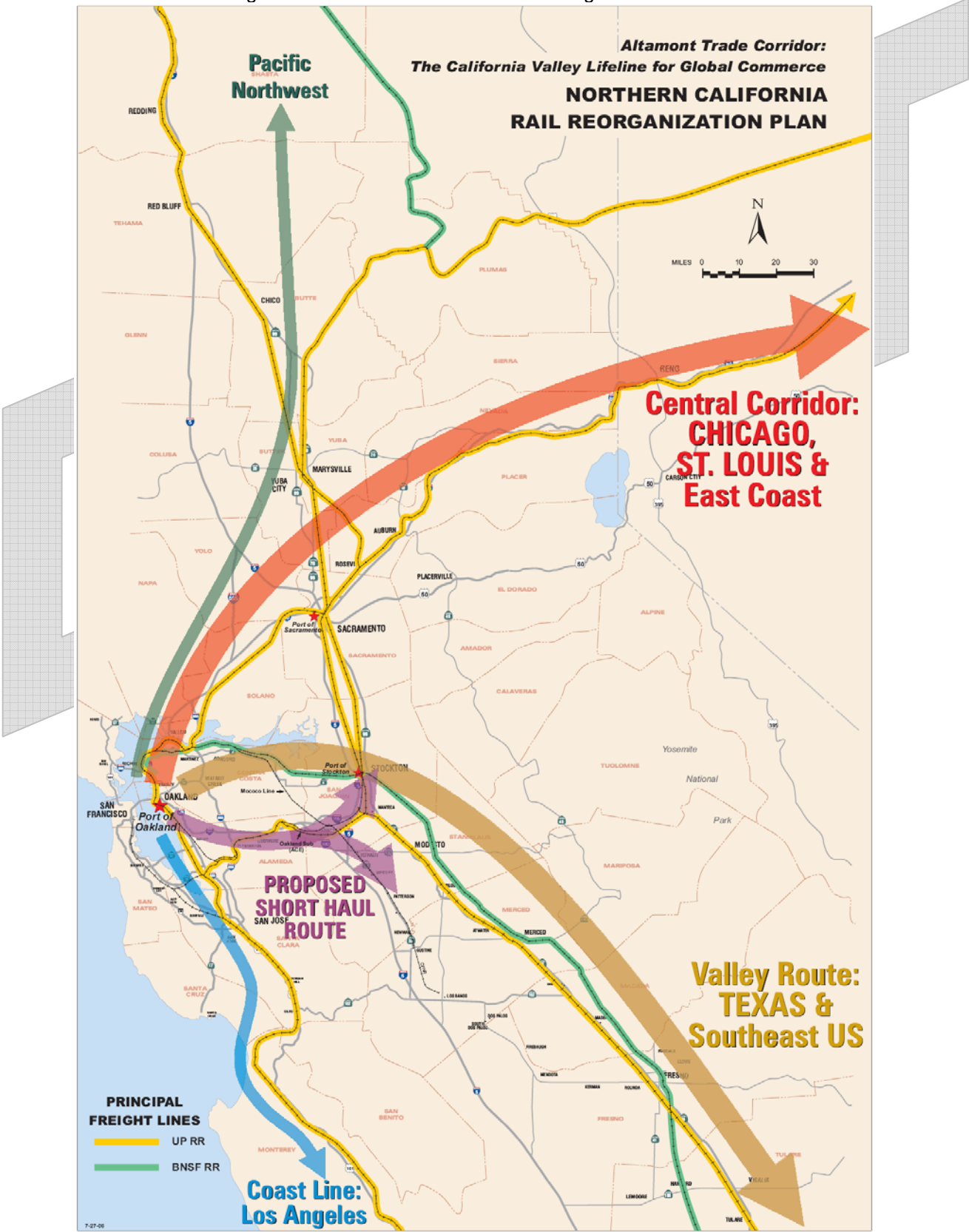
5.0 Use of Altamont Corridor for Short Haul Freight

As previously described, the short haul freight concept shifts freight movements from highways to rail lines, using intermodal facilities to transfer loads from trucks to trains. The Port of Oakland's Maritime development plan supports this concept, noting that maximum port container through-put is achieved by increasing the number of rail moves versus truck moves. Frequent shuttle trains operated either by BNSF, UP or a contractor to and from multiple inland intermodal terminals in the Central Valley could provide the impetus for increasing the proportion of rail hauled containers, with the desired decrease in truck traffic on connector roads and the freeway network in the East Bay and the Central Valley and a reduction in air pollution emissions in the region.

Based on capacity constraints and passenger rail demand in the Bay Area, the proposed short haul service could be routed on the UP line over the Altamont Pass to achieve these goals. Figure 5-1 highlights the proposed short haul route, with passenger service and long haul freight primarily routed on the other rail corridors. The UP route over Altamont Pass has the following advantages:

- Less congestion than the Oakland-Port Chicago bottleneck
- Access to Port of Oakland via a southern connection which does not impact any of the "International" intermodal traffic leaving the Port
- Provides connection to the heart of the central San Joaquin Valley proximate to existing UP intermodal at Lathrop and BNSF at Stockton, Rough & Ready at Port of Stockton, Crows Landing via the West Side Line and others
- Access north and south via UP or BNSF trackage to other Valley intermodal sites
- Potential to re-activate the former SP rail line through Niles Canyon and over Altamont Pass to increase capacity of trunk line for shared operation of passenger corridor trains and short haul freight both operated by regional rail operator
- Potential to develop the line for regional rail freight and passenger use, while allowing access to UP and BNSF for occasional movements under a trackage rights agreement
- ACE trains on this route currently operated by Herzog under contract to San Joaquin Regional Railroad Commission (SJRRRC)
- Potential future purchase of the Altamont Pass route by SJRRRC
- Access to Shafter interim intermodal or transloading site if and when it develops.

Figure 5-1: Northern California Rail Reorganization Plan



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Again, the basic idea for the short haul concept is to initially serve the market to Stockton and just south of Fresno. As a second phase, additional service could include the Sacramento Valley with service through terminals at Woodland and Tehama. Then, ultimately, as a third phase, the short haul freight service could be extended to Medford/Klamath Falls on the north, Reno/Sparks on the east, and around Hanford/Visalia on the south. An extension to Salinas could also be possible in the future. However, such extensions have not been previously contemplated nor have they been studied.

5.1 Short Haul Freight Service Design

Short haul freight service is designed to utilize short trains of approximately 2,000 to 4,000 feet in length, with frequent service each day. The short haul service to and from the Port of Oakland would use conventional intermodal cars (both double stack and hitch cars); although, it could convert to a new type of dedicated platform cars over time. It would provide consolidation of exports to take advantage of higher gross weight permitted on rail than on public roads. In addition, short haul service would cater to California exports and imports of merchandise and durables to distribution centers in truckload quantities. Also, it would offer short haul dedicated carload trains such as coils of steel between ports and a new Toyota stamping plant at Stockton, stamped parts from Stockton to NUMMI in Fremont.

Other services that could be included in the short haul freight concept include:

- Transload of domestic bulk liquid and dry carloads to truck for distribution, including interim storage/holding pending orders (forward inventory and short interval order fulfillment)
- Team tracks and ramps for loading/unloading heavy machinery and equipment
- Container services at a container yard, including inspection, repair, storage, reefer preparation, internal atmosphere control in reefers, tires, etc.
- Trucking support services such as freight brokers/agents, tire repairs/replacement, truck stop, in-ground and portable fuel, truck wash, weigh scales, tractor/engine/drivetrain servicing and repair
- Locations/terminals for other types of trucking services (e.g., parcel, heavy and specialized)
- Locations for appropriate, temporary parking for trucks, tractors, trailers, chassis, etc.
- Coordination with and support for domestic intermodal service that uses the existing domestic intermodal ramps at Lathrop (UP) and Mariposa (BNSF).

Much of the potential market area, commodities, and shipment sizes in the Central Valley are dependent on finding a way to start up service, particularly international intermodal service immediately between the Port of Oakland and Port of Stockton. In the intermediate horizon, it would be important to prove that the short haul service can be successful. Additionally, it would be desirable to retain the flexibility and option to move the operation off of the UP and/or BNSF if they provide some of the startup service. Also, carload service should be provided on the CFNR for equipment and supplies the developer/contractors have to move to the Crows Landing site to get it under construction and an "off-site" facility near Crows Landing on the CFNR for both carload transload and containers to and from the Port of Oakland. In the long term for both Stockton and Crows Landing, it would be ideal to cater to the export market through the Port of Oakland and attempt to attract imports through the Port to existing and future distribution centers in the "catch basin" for a ramp at Stockton and Crows Landing. Specific opportunities for short haul boxcar trains should be responded to as they arise (e.g., Toyota steel coils/stampings).

5.2 Short Haul Benefits and Impacts

5.2.1 Benefits

The benefits of the CIRIS concept are as follows:

- **Employment and Economic.** A successful CIRIS operation would create or encourage new employment opportunities in several categories. CIRIS would require employees in rail operations, terminals, and management positions. CIRIS itself could thus create 25 to 60 employment opportunities; this depends on how extensive the system ultimately becomes and what roles various organizations such as railroads play in CIRIS development. Transloading operations hire unskilled labor, skilled equipment operators, supervisors, clerks, and managers. At 200 annual loads per employee, the 3,576 startup loads would generate about 18 transloading jobs, and the mature service total of 15,516 would generate about 78 jobs. Additional jobs would likely be created in customs brokerage, Free Trade Zones, and related functions.

In addition to direct labor, CIRIS helps strengthen the Port of Oakland, thereby keeping high paying port jobs. It also has the potential to maintain viability of other inner Bay Area light and heavy industries such as the NUMMI plant in Fremont by providing means for moving inputs and outputs without being impacted by highway congestion.

- **Industrial Development.** Issues such as traffic congestion and transportation costs are commanding greater attention in site selection for manufacturing plants and distribution centers. The availability of CIRIS as an alternative or supplement to highway trucking should improve the competitive position of San Joaquin County compared to other locations in Northern and Southern California and result in additional job creation.
- **Congestion Relief.** Congestion relief is a major motivation for CIRIS. An estimated 1,480 container trucks travel I-580 each day to and from the prime CIRIS service territory. The carrying capacity of one rail car is equivalent to four truck loads, and a short haul train typically consists of approximately 30 rail cars. This equates to about 120 trucks (equivalent to 500 automobiles or 25 percent of a freeway lane) that could be removed from the roadways with just one short haul rail trip, resulting in less traffic and grade crossing interferences.

With that said, coaxing traffic off the freeways is not cheap. Rail passenger services are heavily subsidized in California, as they are elsewhere to relieve congestion on heavily traveled commuter routes. The subsidy required by CIRIS to take one truck off the freeway between Oakland and the Central Valley is significantly less than that required to take an equivalent number of passengers off I-80 between Oakland and Sacramento.

CIRIS should not be envisioned as a single solution to truck or traffic congestion on I-580 or other routes. Port truck traffic itself is a relatively small, but highly visible portion of the truck traffic on I-580. CIRIS would more accurately be viewed as one of a broad range of congestion management efforts brought to bear on the growing problem.

- **Air Quality Improvements.** Due to congestion relief, the total annual truck vehicle miles traveled (VMT) diverted by CIRIS could range from about 5 million at the startup to almost 90 million at maturity with 2020 traffic levels. VMT is a direct measurement for vehicle emissions. Therefore, a reduction in VMTs would result in improved air quality.

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- **Highway Maintenance Savings.** Diversion of truck traffic could also result in significant savings in highway maintenance. A Federal Highway Administration (FHWA) study estimated that the year 2000 highway maintenance cost responsibility of combination trucks was 6.9 cents per mile. That figure translates into maintenance cost savings of \$82,482 for Stockton-Modesto service all the way up to \$6,200,587 annually at full maturity in 2020.

5.2.2 Impacts

There are several factors that can affect efforts to divert highway traffic to rail with the CIRIS short haul freight concept:

- **Intermodal Terminal Capacity Limitations.** There needs to be marginally adequate capacity at the UP and BNSF Stockton ramps for the near future. Both carriers have indicated a preference for concentrating all international business in Oakland and leaving the Valley terminals for domestic business. Serving the Fresno market is more problematical. UP does not have an active intermodal terminal in Fresno; BNSF does. The Port of Oakland is actively working with both the BNSF and the UP to increase rail side intermodal terminal capacity at the Port.
- **Line Capacity Limitations.** Track capacity may be the toughest operational issue. Problems with the UP's East Bay Bottleneck are substantial. BNSF's route between Oakland and the Central Valley is nearing capacity due to the growth in both BNSF freight business and Amtrak passenger operations. Here again, the Port of Oakland is discussing helping the UP with the finance and construction of additional main line tracks along the Martinez Subdivision.

There currently are a number of innovative techniques already employed by BNSF and UP to mitigate rail line freight capacity issues:

- Maximize length and capacity of every train
 - Maximize slot utilization of double stack cars
 - Closure of small volume ramps
 - Closure of BNSF's Richmond intermodal facility
 - Closure of UP's Fresno intermodal facility
 - Use of Diesel Propulsion Unit technology
 - Increase of axle loadings
 - Operation of destination trains on a less than daily basis to eliminate short trains and intermediate setouts and pickups
 - De-marketing of unprofitable traffic, particularly in short haul lanes
 - Seeking intermodal hauls of no less than 1,000 miles.
- **Train Capacity.** Depending on how BNSF and UP are serving Central Valley points at present, there may be opportunities to add demonstration or start-up business to existing trains. For example, if BNSF is using an eastbound train from Oakland or Richmond to pick up eastbound intermodal at Stockton and/or Fresno, that train may have capacity for CIRIS traffic on the Oakland-Valley leg. The Stockton and Fresno cars do not necessarily need to be on the same train, or even necessarily on an intermodal train.

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- **Profitability.** CIRIS service will not be a profitable venture, especially on the shorter Oakland-Stockton leg (further discussed below). Although the upward pressure on trucking costs is raising the CIRIS rate and revenue ceiling, the length of haul is basically too short for profitable rail line haul economics. As a result, Class I carriers believe that short haul intermodal initiatives such as CIRIS cannot compete from an economic perspective and will only occur if subsidized. Both BNSF and UP have avoided short hauls, closing small volume ramps and concentrating on longer hauls to fewer destinations to conserve rail line capacity.

Many of these initiatives might at first appear to be in conflict with the CIRIS concept. The question becomes what can be done to mitigate the impacts of CIRIS and to create an incentive for the freight rail carriers that own the corridors to cooperate and participate.

5.2.3 The Economics

Studies have shown that short haul intermodal shuttles by rail cannot currently compete with highway drayage rates. As such, unsubsidized short haul rail shuttles in the 75 to 150 mile range will not be commercially viable or attractive business propositions for the railroads. It is equally clear that developing and operating intermodal facilities is unlikely to be a profitable stand-alone venture. Both will require subsidies or other forms of financial support to succeed in a competitive environment. Thus, it appears that some type of economic incentives would be needed in the market place for container traffic to be shifted to rail.

There are a number of mechanisms that can alter the economics of short hauls. However, most would require some form of legislation or changes in regulation. Box fees on all Northern California destined boxes, applied as a gate fee by the Port of Oakland would be a simple way to alter drayage economics. Emission credits or some form of Congestion Management Agency (CMA) credits for CIRIS boxes, coupled with a CMA fee for boxes moving over the highway, might be another way. The funding for the Alameda Corridor in Southern California might also serve as a model, where the freight cars are assessed a fee to retire the debt on rail improvements.

Introduction of funding mechanisms to increase rail capacity to better enable both short and long haul (and additional passenger service) rail movements between the Port of Oakland and the Central Valley and/or possible economic subsidies for the short haul movements to make rail more competitive with the currently lower truck drayage rates appear to be critical for a CIRIS concept to be effective – to achieve the lower traffic congestion and reduced air emissions goals.

6.0 Implementation Strategies

6.1 Operational and Service Approaches

Operational strategies for implementation of short haul service could include common, dedicated facilities and operations right of way for regional short haul intermodal trains and passenger trains, including interchangeable power and crews (but not railcars), dispatch and signaling, and use by Class I freight only for local service on long haul business and business interruption on their main lines. The service could also coordinate scheduling, primarily to operate short haul freight during the nighttime and midday hours (not at peak commute times). Terminals and grade crossings could also be coordinated, with separate passenger stations and intermodal ramps but designed to allow safe

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operations of through trains passing into and out of each other's terminals/stations (e.g., common passenger car parking and common rail parking, servicing and sidings).

As to marketing and service approaches, common and compatible scheduling would be pursued, with all freights running on "scheduled railroading;" "extra sections" would be acceptable but only in preplanned time slots. Service to local industry would be coordinated with Class I freight service to same industry; specifically, Class I may elect to use new short line railroad as its contract service for pick up and delivery of long haul carloads. The key is to ensure local freight customers are not abandoned. Additionally, all dispatching, train makeup, and crew assignments would be done by the new company using interchangeable personnel. The intermodal facilities could be operated by a contractor (team tracks, lift-on/off ramps and transloads) based on merit and competitiveness.

6.2 *Institutional Arrangements*

Either UP or BNSF could implement a pilot CIRIS operation between Oakland and Stockton. BNSF and UP control the only line-haul rail routes, so if they will not operate a pilot service themselves they might permit either a short line railroad such as the CCT or a contractor (e.g., Herzog under SJRRC) to operate between one or more Central Valley intermodal terminals mentioned and the Port of Oakland.

Assuming a pilot or demonstration project yields favorable results, the next step would be to establish a permanent sponsoring organization in anticipation of long-term operation. The requirements of a sponsoring organization will vary somewhat depending on how the service is organized and what relationship is established with the railroads. Two most promising organizational options include: formation of a Joint Powers Authority (JPA) or use of the San Joaquin Regional Rail Commission as a sponsor.

6.3 *Funding Opportunities*

Achieving the benefits of CIRIS will require investments from both the public and private sectors. Potential funding opportunities include:

- **Federal Funding.** Under SAFETEA-LU, the federal government has expanded funding and eligibility for several existing programs and created new opportunities for the states and local agencies to invest in freight rail in cooperation with the private sector. Both should be useable for CIRIS, but only the CMAQ program is accessible in the near future. The Freight Intermodal Distribution Pilot Grant Program should be applicable if renewed, but is at least two years away.
- **State Funding.** The California Infrastructure and Economic Development Bank (I-Bank) finances public and private infrastructure to promote economic growth. The I-Bank administers several loan programs, of which the following have potential application to CIRIS.
 - *Exempt Facility Revenue Bond Program.* The Exempt Facility Revenue Bond Program provides tax-exempt financing for government-owned projects or private improvements within publicly-owned facilities. This program could conceivably be applied to CIRIS terminal improvements or CIRIS-related improvements at the Ports or inland terminals.
 - *Governmental Revenue Bond Program.* The Governmental Revenue Bond Program provides tax-exempt financing to governmental agencies. Examples include \$10 million for the Port of Stockton for infrastructure improvements at Rough and Ready Island.

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- *California Infrastructure State Revolving Fund (ISRF)*. The ISRF provides low-cost loans for a variety of infrastructure projects. ISRF funding is available in amounts ranging from \$250,000 to \$10,000,000. Eligible project categories include environmental mitigation measures, port facilities, and public transit, so CIRIS would likely fit into the program. Eligible applicants include any subdivision of a local government, including special districts, JPAs, and nonprofit corporations. Preliminary applications are continuously accepted.
- **Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006**. The Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 authorizes \$19.9 billion in State general obligation bonds for specified purposes, including emissions reductions, rail improvements, State-local partnership projects, congestion relief, and other categories that could benefit CIRIS. The California Transportation Commission is responsible for developing project guidelines and approving Caltrans project nominations.
- **Port of Oakland Earmark Funds**. The Port of Oakland received \$720,000 from a Congressional earmark for the CIRIS pilot project. Since it is a congressional earmark, there are fewer constraints in the use of the available funds for implementing the CIRIS pilot project, and the port has two years to expend the amount. The Port is also looking at the potential for State funding from the Goods Movement Action Plan (GMAP).
- **County/Regional Funding**. A vital potential funding source for pilot or ongoing operations is the membership of a JPA. One of the primary purposes of forming a JPA is to spread the costs of regional programs with regional benefits over the relevant jurisdictions. Each of the counties that would join a CIRIS JPA would obtain congestion management, emissions reduction, and economic development benefits. The member counties also have budgets for those functions. One distinct advantage of sharing the funding burden through a CIRIS JPA is the ability of each member to fund its share differently.

7.0 Summary and Conclusions

For CIRIS to be successful, strategies must be implemented to constructively address both the economic issues and the freight and passenger rail capacity needs. In short, the Class I freight railroads – UP and BNSF – who own the rail lines, must be shown some form of benefit from the implementation of CIRIS such as expansion of line capacity and terminals, along with permitting cooperation. Furthermore, passenger rail expansion for eBART, Capitols, Amtrak, ACE and others need to be considered.

Using the UP line over the Altamont Pass for short haul freight service can mitigate these issues, coupled with operational strategies, institutional arrangements, and funding commitments to implement the service. If implemented, the CIRIS concept for short haul service would serve to remove trucks from the highways, thereby alleviating congestion and improving air quality in the San Francisco Bay Area. Additionally, it would provide for an efficient regional rail network, balancing short haul service with long haul and passenger rail needs.